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APPLICATION NUMBER: *60/395,042*
FILING DATE: *July 11, 2002*
RELATED PCT APPLICATION NUMBER: *PCT/US03/21058*

By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

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Certifying Officer

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PTO/SB/16 (02-01)
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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53 (c).

Express Mail Label No. EL 759993433 US

INVENTOR(S)		
Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
John Alan	Gervais	Carmel, Indiana (USA)
Rex Irvin	Beard	Carmel, Indiana (USA)
Mark Ryan	Mayernick	Carmel, Indiana (USA)

☐ *Additional Inventors are being named on the _____ separately numbered sheets attached hereto*

TITLE OF THE INVENTION (280 characters max)

APPLICATION LEVEL GATEWAY AND RULESET DOWNLOAD VALIDATION

CORRESPONDENCE ADDRESS

Direct all correspondence to:

☐ Customer Number [ ] → *Place Customer Number Bar Code Label here*

OR *Type Customer Number here*

☒ Firm *or* Individual Name	JOSEPH S. TRIPOLI, THOMSON MULTIMEDIA LICENSING INC.				
Address	PATENT OPERATIONS.				
Address	P. O. BOX 5312				
City	PRINCETON	State	NJ	ZIP	08543-5312
Country	USA	Telephone	609-734-9444	Fax	609-734-9700

ENCLOSED APPLICATION PARTS *(check all that apply)*

☒ Specification *Number of Pages* 2 ☐ CD(s), Number [ ]

☒ Drawing(s) *Number of Sheets* 2 ☐ Other (specify) [ ]

☐ Application Data Sheet. See 37 CFR 1.76

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT *(check one)*

☐ Applicant claims small entity status. See 37 CFR 1.27.

☐ A check or money order is enclosed to cover the filing fees

FILING FEE AMOUNT ($)

☒ The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: 07-0832 — 160

☐ Payment by credit card. Form PTO-2038 is attached.

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are: _____.

Respectfully submitted,

SIGNATURE [signature] Date 7/11/02

TYPED or PRINTED NAME Ronald H. Kurdyla REGISTRATION NO. *(if appropriate)* 26,932

TELEPHONE 609 734-9701 Docket Number: PU020335

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is used by the public to file (and by the PTO to process) a provisional application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the complete provisional application to the PTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C. 20231.

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FEE TRANSMITTAL for FY 2002

Patent fees are subject to annual revision.

TOTAL AMOUNT OF PAYMENT ($) 160

Complete If Known	
Application Number	
Filing Date	Herewith
First Named Inventor	J. A. Gervais, et al.
Examiner Name	N/A
Group / Art Unit	N/A
Attorney Docket No	PU020335

METHOD OF PAYMENT (check one)

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit Account Number: 07-0832

Deposit Account Name: THOMSON multimedia Licensing Inc.

☒ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17

☐ Applicant claims small entity status. See 37 CFR 1.27

2. ☐ Payment Enclosed:

☐ Check ☐ Credit card ☐ Money Order ☐ Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
101	740	201	370	Utility filing fee	
106	330	206	165	Design filing fee	
107	510	207	255	Plant filing fee	
108	740	208	370	Reissue filing fee	
114	160	214	80	Provisional filing fee	160

SUBTOTAL (1) ($) 160

2. EXTRA CLAIM FEES

			Extra Claims		Fee from below		Fee Paid
Total Claims		-20 ** =	0	X		=	0
Independent Claims		-3 ** =	0	X		=	0
Multiple Dependent				X		=	0

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
103	18	203	9	Claims in excess of 20
102	84	202	42	Independent claims in excess of 3
104	280	204	140	Multiple dependent claim, if not paid
109	84	209	42	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 0

**or number previously paid, if greater. For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet.	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	
116	400	216	200	Extension for reply within second month	
117	920	217	460	Extension for reply within third month	
118	1,440	218	720	Extension for reply within fourth month	
128	1,960	228	980	Extension for reply within fifth month	
119	320	219	160	Notice of Appeal	
120	320	220	160	Filing a brief in support of an appeal	
121	280	221	140	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive – unavoidable	
141	1,280	241	640	Petition to revive – unintentional	
142	1,280	242	640	Utility issue fee (or reissue)	
143	460	243	230	Design issue fee	
144	620	244	310	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Processing fee under 37 CFR 1.17 (q)	
126	180	126	180	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	
146	740	246	370	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	740	249	370	For each additional invention to be examined (37 CFR § 1.129(b))	
179	740	279	370	Request for Continued Examination (RCE)	
169	900	169	900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid SUBTOTAL (3) ($) 0

SUBMITTED BY				Complete (if applicable)	
Name (Print/Type)	Ronald H. Kurdyla	Registration No. Attorney/Agent	26,932	Telephone	609.734.9701
Signature				Date	July 11, 2002

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APPLICATION LEVEL GATEWAY AND RULESET DOWNLOAD VALIDATION

It is important to validate that an Application Level Gateway (ALG) or Firewall Ruleset is compatible with a modem or similar device prior to its execution or use on that device. Failure to do so can cause the unit to crash or hang if an attempt is made to use an incompatible ALG or Ruleset. Compatibility must be certain with not only the device hardware, but also the device software and general configuration.

Field upgradeable products are becoming more prevalent in the market today. Devices can have ALGs and/or Firewall Rulesets downloaded remotely to them while in the customer's home. This feature places the unit at higher risk to an invalid ALG or Ruleset download since the failure mechanism caused by an invalid ALG or Ruleset may place the device in a non-remote manageable state. This can result in having to recall the unit for repair.

The invention is a method for validating the compatibility of an ALG or Firewall Ruleset on a receiving device prior to its use. If the validation algorithm indicates the ALG or Ruleset is not compatible with the hardware or software configuration of a device, it can be safely rejected. This will prevent a possible non-recoverable error condition which might exist if an attempt is made to use a non-compatible ALG or Ruleset

The algorithm consists of attaching or otherwise embedding in a predictable location on the ALG or Ruleset information regarding the hardware family, software version range and general product configuration with which this ALG or Ruleset is compatible. This can be done by means of attaching a header or trailer on the ALG or Ruleset file. From this point on this compatibility data will be referred to as the *header*.

Specifically the algorithm validates the following parameters associated with the ALG or Firewall Ruleset:

- Information Version
- Size
- CRC
- Signature
- Compatible Hardware Version Family
- Compatible Software Version Family

The discrimination items above are discussed in the paragraphs below.

The first item to validate is a version number of the information describing the ALG or Firewall Ruleset file. If the software performing this discrimination is not familiar with this format of information, it may look in the incorrect location for key information or misinterpret

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information in the ALG or Ruleset's header. If the Information Version is not known by the discrimination algorithm, the ALG or Ruleset must be rejected.

If the ALG or Firewall Ruleset is too large to store in memory (typically non-volatile), it must be rejected as non-compatible. Failure to do this might result in a truncated file or a overrun into memory not allocated for its storage.

Next, a Cyclic Redundancy Check (CRC) is performed on the header information so as to validate the information is correct. This is done after the length and version are examined so as to insure the CRC value and the length over which the CRC is performed are correct. Although the probability of finding a valid CRC in an incorrect location in the header or by performing the CRC algorithm over an incorrect length is remote, this is considered more prudent. If the CRC fails, the ALG or Firewall Ruleset must be rejected.

If a cryptography signature is present in the file, it must now be validated. This will insure the ALG or Firewall Ruleset file is from a trusted source. If the source of the ALG or Ruleset cannot be validated, it must be rejected.

Next the ALG or Ruleset header should contain a list or range of compatible hardware version(s). If upon examination the hardware version of the device on which the ALG or Ruleset is to be executed is not within this range/list, it must be rejected.

Finally the ALG or Ruleset header should contain a list or range of compatible software version(s). If upon examination the software version of the device on which the ALG or Ruleset is to be executed is not within this range/list, it must be rejected.

Additional discriminations can be interspersed into the above as necessary. If all discriminations accept the ALG or Ruleset, it may be used on the device without risk. This is contingent on the validity of the information in its header.

Figure 1 is a block diagram of a cable modem including a BCM3345 Cable Modem integrated circuit processor, suitable for employing the method of the invention.

Figure 2 shows the cable modem of Figure 1 connected to the Internet, to a home network including multiple PCs via an Ethernet port, and to an individual PC via a USB port.

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Hardware Block Diagram

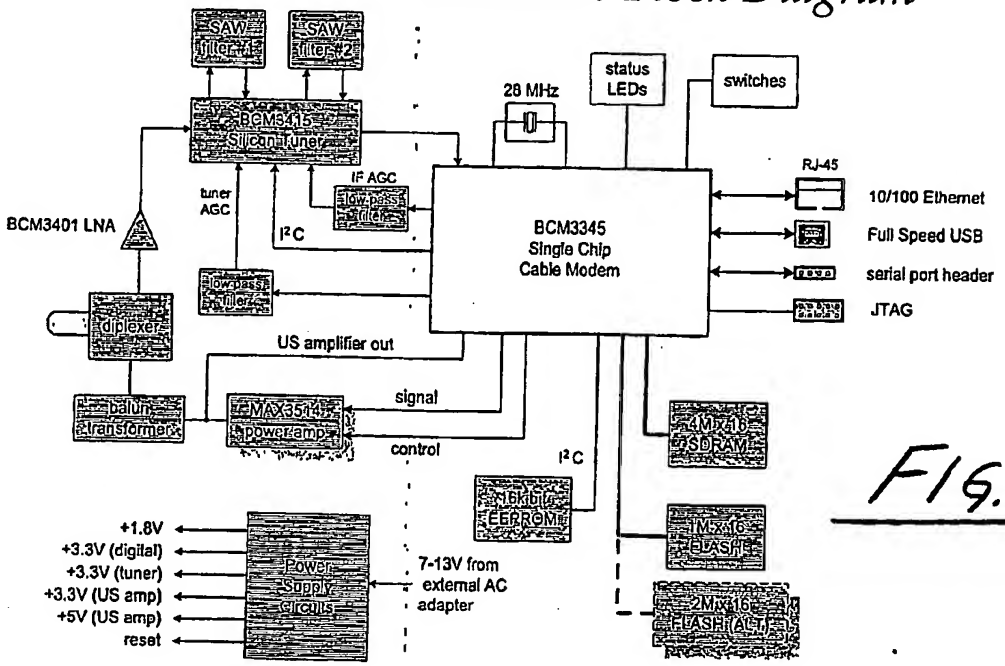

FIG. 1

FIG. 2

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